

# Collecting Litter Samples for Analysis

Alabama Guide Sheet No. AL 590A



## DEFINITION

Poultry litter is a valuable by-product of the poultry industry. It has good nutritional value if used as fertilizer. It is essential that the nutrient content be known for the safest and most efficient use of the product. Also, recent regulations enacted at the federal and state levels require poultry litter to be analyzed prior to land application under certain situations. Litter is required to be analyzed each year for three years or more until a trend is established for the nutrient content of a specific litter source. Thereafter litter may be analyzed once every three years if there is no change in the poultry production method.

All litter is not managed the same way, and its nutrient content can vary considerably from one operation to another. For instance, the nitrogen (N) content of samples analyzed at Auburn University ranged from 29 to 84 pounds of N per ton of litter (wet weight basis). Even within a single house or stockpile of litter there is typically much variation. The N content will also decrease with time while the litter waits for spreading. For these reasons it is very important that proper sampling techniques be used so that the actual nutrient content of the litter may be accurately determined.

## Sample Collection

**General Procedure:** A sample to be tested must be representative of the entire batch of litter. Therefore, in all cases several small samples should be collected and mixed together to form a composite sample. Due to the variability of the nutrient content even in a single pile of litter, at least 25 smaller samples should be used to prepare each composite sample. A narrow shovel or a soils auger is a useful tool for taking samples, especially if sampling below the surface of a stockpile. Clean five-gallon buckets are convenient to use for collecting and mixing the individual small samples into one large composite sample.

For convenience, a quart size zip-lock bag may be filled with a portion of the composite sample for shipment to the lab. Use a permanent marker to print the following information on the bag (and do this before adding the litter to the bag):

- Name and address of person to receive the test results
- Type of poultry producing the litter (broiler, breeder, Cornish, etc.)
- Number of flocks grown on this litter
- Identifying house number or name
- Method of sampling (see below)

As a precautionary measure, include the same information on a 3 x 5 index card and place it in the bag with the litter.

**Methods of Collection:** There are basically four methods of collecting litter samples for analysis. Each method is discussed as follows:

**In-house:** Samples are collected throughout the house before cleanout. Sampling should be done as close to cleanout as possible so that the sample represents the actual nutrient content at the time of spreading. About one-fourth of the samples should be collected under or near waterers and feeders, and the rest collected throughout the house in the middle, near walls, etc. Sample litter from the top surface to the depth that the litter will be removed. Be careful not to include any soil in the sample. **Advantage:** Litter can be analyzed in advance of cleanout so the results are available at the time of cleanout and utilization. **Disadvantage:** The sample may not be representative of the actual product removed from the house if the sample is taken some time before the last flock is removed or if the equipment operator scrapes below the depth of sample collection and removes soil, too.

**During cleanout:** Samples are collected as litter is loaded onto the spreader or as it is temporarily stockpiled prior to spreading. Individual samples should be collected at regular intervals throughout the cleanout.

**Advantage:** Samples represent what actually is being removed, including any soil. **Disadvantage:** The lab report will not be complete before the litter is spread, if spreading is immediate. However, the data can be used for the next cleanout, assuming that all other factors remain the same (same type and number of birds, flocks grown, amount of bedding used, cleanout method, etc.).

**From stockpile:** Litter may be stockpiled for later spreading. However, the heat generated in a litter stack can change its chemical characteristics. Since temperatures will peak in 10 to 20 days after initial stacking, samples should be collected after the temperature drops and as close to the spreading time as possible. Individual samples should be collected at several points around the pile. No more than one-fourth of the samples should be collected from the surface

layer, with the rest being taken from a depth of one foot to the bottom of the pile. **Advantages:** The actual nutrient analysis of the litter will be known after it has gone through natural heating and will be available prior to use. **Disadvantage:** None.

**During spreading:** A plastic sheet or containers are placed in the field to collect litter as it is spread.

**Advantages:** This method is the most accurate since it represents the actual nutrients applied to the crop. The application rate may also be determined with this method. **Disadvantage:** Same as "During Cleanout" above.

### **Storage and Shipment**

Samples should be shipped to the lab the same day they are collected. Samples that cannot be shipped the same day should be kept refrigerated. It is advisable to keep samples on ice even during shipment to the lab, if possible.

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